UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,287	12/21/2001	Tadashi Tsuyuki	9319S-000308	4058

27572 7590 03/14/2003

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER
DI GRAZIO, JEANNE A

ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 03/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/032,287	TSUYUKI ET AL.	
	Examiner	Art Unit	
	Jeanne A. Di Grazio	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19* is/are rejected.

7)☒ Claim(s) *11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Priority

Foreign priority to the following is claimed: JP 2000-392828 (12/25/00) and JP 2001-347606 (11/13/01).

Claim Objections

Claim 11 is objected to because of the following informality: Applicant should replace "valleys" with "concavities" for consistency. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1, 2, 9,17, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Abe et al. (US '460).

Per claim 1: A substrate for a liquid crystal device [Figure 2, Ref. Item 11] with a base [See Figure 2]; and a light reflecting film formed on said base [Figure 2, Ref. Item 27] said light reflecting film having a pattern that displays light directivity and light scattering [Col. 2, Lines 15-22].

Per claim 2: The pattern is formed by aligning at least one of a plurality of convexities and concavities [See Figure 1].

Per claim 9: The convexities or concavities are all in the same direction and randomly arranged within a plane [Figure 1].

Per claim 17: A pair of substrates [Figure 2, Ref. Items 11 and 12], one substrate including a light reflecting film having a pattern that displays light directivity and light scattering [Figure 2, Ref. Item 27]; and liquid crystal sandwiched between the pair of substrates [Figure 2, Ref. Item 71].

Per claim 19: Abe has a liquid crystal device [Summary of Invention]. Abe has an LCD including a pair of substrates [Figure 2] one substrate including a light reflecting film having a pattern that displays light directivity and light scattering [Figure 2] and a liquid crystal sandwiched between the pair of substrates [Figure 2]. Abe does not specify a case accommodating the LCD; however, a case to accommodate an LCD is inherent whether the LCD is a portable computer, television, phone, etc.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 3-6, 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (US '460), Mitsui et al. (US '635), Umemoto (US 2002/0039155 A1) and Yoshida et al. (US 2002/0122144 A1) in view of Funada (JP 2000-321998).

Per claims 3-6: Applicant recites a spatial shape of the convexities or concavities along one of two orthogonal axes passing through the convexities or concavities that is different from a

spatial shape extending along the other axis, one side of a spatial shape of the convexities or concavities bisected by at least one of the two orthogonal axes that pass through the convexities or concavities is asymmetric with the other side, one side of a surface area of the spatial shape is asymmetric with the other side, and one angle of the spatial shape with respect to the base is asymmetric with another angle of the spatial shape with respect to the base. Abe does not appear to have these recitations; however, the references noted and cited with respect to claim 8 (below) have convexities of such pattern and shape that they inherently posses these recitations. Based on the shapes as recited in claim 8 for the convexities and concavities, they will have these elements as recited by Applicant. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abe in view of Umemoto for light to be used as an illumination light and for a reduction in thickness. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abe in view of Yoshida to vary the quantity of light and for illumination efficiency. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abe in view of Funada for large depth space and spread.

Per claim 8: Abe does not appear to specify convexities or concavities of a rectangular pyramid shape in plane section, a rectangular dome shape in plane section, an elliptical dome shape in plane section or a long dome shape in plane section; however, Umemoto (US 2002/0039155 A1) has: convex or concave prismatic structures in an optical path control layer that are substantially like a triangle or quadrangle in shape [Claim 12, for example]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abe in view of Umemoto for light to be used as illumination light [0046] and for a

reduction in thickness [0047]. Yoshida et al. (US 2002/0122144 A1) has concavities of a substantially semi-elliptical cross section [0127]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abe in view of Yoshida to vary quantity of light and for illumination efficiency [0129 and 0130]. Japanese Patent Application No. 2000-321998 to Funada also has a light reflection plate of a dome shape. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abe in view of Funada for large depth space and spread as noted in Funada.

Per claim 10: Abe does not appear to specify that at least one of the two orthogonal axes is parallel with the edge of the base; however, in view of Umemoto, Yoshida, and Funada, it would have been obvious to one of ordinary skill in the art to have at least an orthogonal axis parallel with the edge of the base for ease in measurement of light quantity and as a convenient reference when measuring light quantity.

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al. (US '460) in view of Mitsui et al. (US '635).

Per claim 7: Abe does not appear to have convexities or concavities of a teardrop shape; however, Mitsui teaches a photomask with pattern holes that may be oval in shape [Col. 6, Lines 50-51]. The photomask is used to make convex portions of a reflective surface [Col. 5, Lines 1-10]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abe in view of Mitsui for reflected light rays that do not interfere with each other [Col. 5, Lines 4-5] and so that when using a photomask to make the reflective surface the formation of the convex portions is made possible with good reproducibility under the same light irradiation conditions [Col. 6, Lines 5-10].

4. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsui et al. (US '635) in view of Yoshinobu et al. (JP 06-102507).

Per claim 11: Mitsui has a substrate for an LCD that is one of a pair of substrates sandwiching a liquid crystal and that is positioned opposite from a viewing-side substrate, comprising a base and a light reflecting film formed on the base [Col. 3, Lines 1-11]. Mitsui also has a continuous wave shape on an upper surface of the reflective electrode [Id.]. Wave shapes have convexities and concavities. Mitsui does not appear to specify that a profile of the amount of light along one of two orthogonal axes that pass through said convexities or concavities ("valleys") is different from the profile of the amount of light along the other of two orthogonal axes; however, Yoshinobu does have light quantity adjusting pattern [PAJ]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Mitsui in view of Yoshinobu for improving luminance as noted in Yoshinobu.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsui et al. (US '635) and Yoshinobu et al. (JP 06-102507) in view of Umemoto et al. (US 2002/0005922 A1).

Per claim 12: Applicant recites a profile of the amount of light along said one axis that is peak shaped, and said profile of the amount of light along the other axis is a straight line. Mitsui does not appear to have these elements. Yoshinobu may be interpreted to inherently posses these features; however, for clarification, Umemoto specifies that "[s]cattered light generally exhibits a normal distribution with a peak in a regular reflection direction [0010]." Umemoto also has a scattering reflection system that adjusts the intensity of scattering [0010 and 0011]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to

modify Mitsui in view of Umemoto to "keep the balance between the external light mode and the illumination mode [0010]."

6. Claims 13-16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitsui et al. (US '635) in view of Umemoto (US 2002/0039155 A1) and Yoshida et al. (US 2002/0122144 A1) in view of Funada (JP 2000-321998).

Per claims 13, 14, and 18: Mitsui has the step of forming a light reflecting film on a surface of a base (substrate) and employing a mask to form at least one of a plurality of convexities and concavities on the surface of the light reflecting film [Col. 5, Lines 1-11 and Col. 6, Lines 50-51]. Mitsui also has mask patterns of different shapes [Col. 6, Lines 50-51] and these shapes are irregular [Id.]. Mitsui does not appear to specify that the shape of the mask pattern of the mask for the convexities and concavities along one of two orthogonal axes that pass through the convexities or concavities is different from the shape that extends along the other axis / bisected by at least one of two orthogonal axes that pass through the convexities or concavities is asymmetric with the other side; however, Umemoto, Yoshida, and Funada have convexities and concavities of such a shape that the shape of a mask pattern of a mask for the convexities and concavities along one of two orthogonal axes that pass through the convexities or concavities is different from the shape that extends along the other axis / bisected by at least one of two orthogonal axes that pass through the convexities or concavities is asymmetric with the other side as has been previously addressed with respect to claims 3-6. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abe in view of Umemoto for light to be used as an illumination light and for a reduction in thickness. It would have been obvious to one of ordinary skill in the art at the time the invention was made to

modify Abe in view of Yoshida to vary the quantity of light and for illumination efficiency. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Abe in view of Funada for large depth space and spread.

Per claim 15: Mitsui has a mask pattern of an oval shape [Col. 6, Lines 50-51]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a mask pattern of a planar teardrop shape for reflected light rays that do not interfere with each other [Col. 5, Lines 4-5] and so that when using a photomask to make the reflective surface the formation of the convex portions is made possible with good reproducibility under the same light irradiation conditions [Col. 6, Lines 5-10].

Per claim 16: Mitsui has pattern holes of a photomask formed at random [Col. 6, Lines 42-44]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have mask patterns in the same direction and randomly arranged in a plane for a reflective film and method of making such a film of satisfactory reflection characteristics less dependent on wavelength and having good reproducibility [Col. 3, Lines 12-28].

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeanne A. Di Grazio whose telephone number is (703)305-7009. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703)746-8741 for regular communications and (703)746-8741 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

Jeanne Andrea Di Grazio

Robert Kim, SPE

JDG
March 5, 2003

TOAN TON
PRIMARY EXAMINER